

We claim:

1. A transceiver comprising:
an antenna array having a plurality of antennas; and
a scattering structure associated with the antennas for receiving the signals from the antennas.
2. A transceiver according to claim 1, wherein the scattering structure is a passive structure.
3. A transceiver according to claim 1, wherein the scattering property of the scattering structure can be externally adjusted.
4. A transceiver according to claim 1, further comprising a controller for controlling the scattering structure.
5. A transceiver according to claim 4, wherein the controller controls the scattering structure to modify the eigenmodes formed between the transceiver and a receiver.
6. A transceiver according to claim 4, wherein the controller receives feedback information from the receiver and uses the feedback information for controlling the scattering structure.
7. A transceiver according to claim 1, wherein the scattering structure scatters the incident signals by at least one of diffraction, reflection or refraction or use of a waveguide.
8. A transceiver according to claim 1, wherein the scattering structure is a diffraction grating.
9. A transceiver according to claim 1, wherein the scattering structure comprises one or more scattering elements, each associated with one or more of said antennas.

10. A transceiver for use with a second transceiver comprising an antenna array having a plurality of antennas and a scattering structure associated with the antennas for receiving the signals from the antennas, the transceiver having
- an antenna array having a plurality of antennas;
 - feed back means for generating feedback information about the properties of the signals received by the antenna array; and
 - transmission means for sending said feedback information to said second transceiver for adjusting said scattering structure.
11. A communication system comprising a first transceiver and a second transceiver, the second transceiver comprising:
- a second transceiver antenna array having a plurality of antennas;
 - a scattering structure associated with the antennas for receiving the signals from the antennas; and
 - a controller for controlling the scattering structure, and the first transceiver comprising:
- a first transceiver antenna array having a plurality of antennas;
 - feed-back means for generating feedback information about the properties of the signals received by the first transceiver antenna array; and
 - transmission means for sending said feedback information to said second transceiver for adjusting said scattering structure.
12. A communication system including a transceiver according to claim 1.
13. A method of scattering signals produced by an array of antennas, the method comprising:
- interposing a scattering structure between the antennas and a receiver to scatter the beams produced by the antennas,
 - receiving feedback information concerning the strength of the eigenmodes established between the antennas and a receiver; and
 - adjusting the scattering structure to vary the scattering of the beams produced by the antennas.

14. A method according to claim 13, wherein the scattering structure is a passive structure.
15. A method according to claim 13, wherein the scattering structure scatters the incident signals by at least one of diffraction, reflection or refraction.
16. A method according to claim 13, wherein the scattering structure is a diffraction grating
17. A method according to claim 13, wherein the scattering structure comprises one or more scattering elements, each associated with one or more of said antennas.
18. A transceiver comprising:
 - an antenna array having a plurality of antennas; and
 - a scattering structure associated with the antennas for receiving incoming signals and passing them on to the array of antennas.
19. A transceiver according to claim 18, wherein the scattering structure is a passive structure.
20. A transceiver according to claim 18, wherein the scattering property of the scattering structure can be externally adjusted.
21. A transceiver according to claim 18, further comprising a controller for controlling the scattering structure.
22. transceiver according to claim 21, wherein the controller controls the scattering structure to modify the eigenmodes formed between the transceiver and a transmitter.
23. A transceiver according to claim 21, wherein the controller analyses the received signal and uses the information for controlling the scattering structure.

24. A transceiver according to claim 18, wherein the scattering structure scatters the incident signals by at least one of diffraction, reflection or refraction or use of a wave-guide.
25. A transceiver according to claim 18, wherein the scattering structure is a diffraction grating.
26. A transceiver according to claim 18, wherein the scattering structure comprises one or more scattering elements, each associated with one or more of said antennas.